JOURNAL

OF THE

New York Entomological Society.

EDITED BY WILLIAM MORTON WHEELER.

Publishes articles relating to any class of the subkingdom Arthropoda, subject to the acceptance of the Publication Committee. Original communications in this field are solicited.

PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY.

MEETING OF MAY 21, 1907.

Held at the American Museum of Natural History. President C. W. Leng in the chair, with nine members present and one visitor.

The proceedings of May 7 were read and approved.

Dr. Southwick read the report of the committee appointed to draft a document to be presented before the New York Academy of Sciences and its friends to commemorate the birthday of Linnæus. On motion of Mr. Bischoff the committee was discharged.

Mr. W. J. Davis of the field committee reported that an outing at Overbrook, N. J., had been arranged for Decoration Day.

Mr. Engelhardt proposed Mr. Robert P. Dow, 741 Carroll St., Brooklyn, as an active member. On motion of Mr. Roberts the by-laws were suspended and Mr. Dow was elected on a single ballot cast by the secretary.

Mr. Dow moved that the librarian determine the number of volumes in the library which needed binding and report the estimated cost at the next meeting of the society. Seconded and carried.

Mr. Davis exhibited all of the species of tree crickets occurring in the vicinity of New York and made some remarks concerning the more unusual forms.

Mr. Roberts exhibited all of the Haliplidæ occurring in the United States except two. In remarking on this family of the aquatic Coleoptera he stated that Crotch's attempt to work up the group had perhaps done more harm than good, as he failed to recognize and appreciate good structural characters and did not differentiate the males and females. Mr. Roberts after considerable study had found good distinguishing characters between the males and females in the peculiar character of the fore tarsi of the former sex. He had also found the prosternal process a good specific character as well as the coxal process. Although in several species the markings seem similar, when taken in connection with the structural characters here men-

tioned, differences can easily be detected which are uniform for one species, and the constancy of pattern of maculation is remarkable. He had been able to separate 19 species of *Haliplus* and 10 species of *Cnemidotus*. Nothing concerning the larvæ or of the life history of our species is known.

Mr. Joutel exhibited *Cynthia* and *Promethia* moth hybrids. When the female *Cynthia* is crossed with the *Promethia* male the larva was typically *Cynthia*. In the male *Cynthia* and *Promethia* female cross the larvæ are very different, as the *Cynthia* seem to be the stronger and give the predominating characters to the hybrid.

Mr. Matausch exhibited some excellent color drawings of a number of leaf-hoppers (Membracidæ). Upon motion of the secretary the meetings of the society were adjourned until October.

MEETING OF OCTOBER 1, 1907.

Held at the American Museum of Natural History. President C. W. Leng in the chair, with ten members and one visitor present.

The librarian, Mr. Schæffer, reported the receipt of the following exchanges during the summer:

Tijdschrift voor Entomologie, Vols. XLIX, No. 4; L, No. 1.

The Decticinæ of North America by A. N. Caudell in Proc. U. S. Nat. Mus., Vol. XXXII, pp. 285–410.

Proc. of the Am. Acad. Arts and Sciences, Vol. XLII, Nos. 27 and 28.

Verhandlungen d. K. K. Zool.-bot. Gesell. in Wien, Vol. LVII, Nos. 2, 3, 4, 5, 6, and 7.

Canadian Entomologist, Vol. XXXIX, Nos. 6, 7, 8, and 9.

Deutsche Entomolog. Zeitschr., 1907. Nos. 3 and 4.

Berliner Entomolog. Zeitschr., Vol. 51, No. 4.

Wiener Entomolog. Zeitung, Vol. XXVI, Nos. 4, 5, 6, 7, 8, and 9.

Anales del Museo Nacional de Buenos Aires, 3d ser., Vols. VI and VIII.

A New Butterfly of the Genus Incisalia by Cook and Watson.

Mittheilungen d. Schweiz Entomol. Gesell., Vol. XI, No. 6.

The Insect World, Vol. XI, Nos. 5, 6, 7, and 8.

Zeitschr. f. Wissenschaftliche Insekt.-biol., Vol. III, No. 4.

Proc. Davenport Acad. Sciences, Vol. XI, pp. 125–417.

N. J. Agri. Exp. Station Bull., No. 203.

Note on the American Species of Hesperidæ described by Plätz. F. D. Goodman.

Rep't of the Entom. Dept. N. J. College Exp. Station for 1906.

Montana Agri. College Exp. Station Bull., Nos. 62 and 64.

Catalogue of the Acarina of the U. S. by N. Banks from Proc. U. S. Nat. Mus., Vol. XXXII.

Descriptions of New Species of Moths by Harrison G. Dyar from Proc. U. S. Nat. Mus., Vol. XXXII.

University of Montana Register, 1906–1907.

Proc. Amer. Phil. Soc., Vol. XLVI, No. 185.

Stettiner Entomolog. Zeitung, Vol. 68, No. 1.

Bull. Soc. Entomolog. Italiana, Vol. XXXVIII, Nos. 1 and 2.

Fungus-growing Ants of North America by Prof. W. M. Wheeler.

Chicago Acad. Sci. Bull., No. 4, Pts. 1 and 2.

Notes on a New Guest Ant by Prof. W. M. Wheeler.

Entomolog. Berichten, II, Nos. 31–36.

Notes on some American Noctuids in the British Museum by Prof. John B. Smith.

Bull. No. 24, Georgia State Board of Entomology.

Ent. Circul. No. 20, No. Carolina Dept. Agriculture.

Proc. Amer. Philos. Soc., Vol. XLVI, No. 186.

The treasurer, Mr. Davis, reported that the society's balance was $909.86 and the journal's $197.51.

Mr. Davis exhibited some ants, one of which (*Sysphincta pergandei* Roger) Professor Wheeler mentioned as being a very rare insect, previously taken by only two other collectors, Father J. Schmitt and Mr. T. Pergande. Professor Wheeler had never been able to find a specimen of this species.

Professor Wheeler gave a most interesting account of his summer's trip, briefly sketching his stop in the Azores, Gibralter, Genoa and in the neighborhood of Lake Geneva. His account of the work of Professor Forel, with whom he visited for six weeks, was most entertaining.

Society adjourned.

MEETING OF OCTOBER 15, 1907.

Held at the American Museum of Natural History. President C. W. Leng in the chair, with twelve members present. The proceedings of May 21 and October 1 were read and approved.

The librarian, Mr. Schaeffer, reported the receipt of the following exchanges:

Proc. Amer. Acad. Arts and Sciences, Vol. XLII, No. 29.

Canad. Entomologist, Vol. XXXIX, No. 10.

Anales de Museo Nacional de Montevideo, Vol. VI.

Berliner Entomolog. Zeitschr., Vols. LII, No. 1 and XLII, Nos. 1 and 2.

38 pamphlets on Ants presented to the society by Miss Adele M. Fielde through Professor Wheeler.

Mr. Southwick moved that the librarian determine the cost of binding the remaining files of the Journal of the New York Entomological Society and report same at the next meeting of the society.

Mr. Zabriski reported that he was one of a committee appointed by the Brooklyn Entomological Society to prepare a list of insects of Long Island. He requested the coöperation of the members of the New York Society in this work.

Professor Wheeler exhibited the work of an ant (*Azteca muelleri*) in the trunk of the *Cecropia* tree (*Cecropia adenopus*). Professor Wheeler remarked that while in Hamburg during last summer he heard through the Museum there of a man who had brought from Santa Catharina, Brazil, a great number of the trunks of the *Cecropia* tree containing these ant-nests. He was able to secure a number of excellent examples of their workings. Though there was considerable confusion in the synonomy of this particular ant, it was undoubtedly *Azteca muelleri* Emery. A number of *Azteca* species are known and all are neotropical and exclusively arboreal, as they have never been known to nest in the ground. The food of *A. muelleri* is an excretion of the trees produced in peculiar cushion-like growths (*trichilia*) at the bases of the leaf petioles. These ants do not have a sting but are protected by a rancid smelling excretion which acts as a repellant to their foes. These ants make their way into the interior of the

hollow tree trunks by boring holes in preformed pits which occur above each leaf petiole. The large swellings caused by the work of this ant were supposed by von Ihering to be large galls, but Professor Wheeler remarked that it was more likely that the bulging outward of the sap-wood of the trunk was due to stress of weight where the wood becomes thin. Another species of *Azteca* (*A. lanuginosa*) exhibited showed the nest on the outside of the *Cecropia*. Still another made a long pendulous nest. Professor Wheeler also mentioned other peculiarities both in the nests and in the structure of the body of these ants. He also exhibited and spoke of the peculiar "cow-sheds" made by ants over alder aphids (*Schizoneura tessellata*) which he had collected at Lakehurst.

Mr. Davis spoke of experimenting with acetic ether recently as a killing reagent for insects. He placed some "excelsior" in a wide-mouthed bottle and moistened it with this new killing reagent. He found it worked very satisfactorily, not changing the colors of the moths and katydids, which were left sometime in the bottle. It does not evaporate readily and is not as cheap a method as cyanide of potassium. Mr. Bischoff said that he had tried acetic ether as a killing reagent and found it very unsatisfactory, for when the insects were left several hours in the bottle the legs and antennæ became very brittle.

Mr. Davis also exhibited specimens of a beetle (*Coscinoptera dominicana* Fab.) raised from pupæ found in ants'-nests (*Formica schaufussi*) in Newfoundland, N. J.

Professor Wheeler exhibited a series of myrmecophilous beetles and Lycænid larvæ which he had recently received from Staudinger and Bang-Haas of Dresden. He spoke of the glands on the Lycænid larvæ and the peculiar extrusile processes which were covered with plumose hairs, on the dorsal part of the last segment. The function of these organs is still unknown. Of the myrmecophilous beetles he spoke particularly of the members of the genus *Paussus*, none of which occur in North America. He called attention to the fact that these beetles secrete pure iodine, according to Loman. The antennæ are peculiar in shape, the ants using them as handles with which to carry the beetles about. Some curious ant-like spiders from Peru were also shown.

Mr. Engelhardt showed the flattened cases made by the fastening together of oak leaves by the larvæ of the moth *Cecinnus melsheimeri* Harris. In some of these the larvæ were still present.

Society adjourned.

MEETING OF NOVEMBER 19, 1907.

Held at the American Museum of Natural History. President C. W. Leng in the chair, with eleven members and several visitors present.

The report of the treasurer, Mr. Davis, was read and accepted. Mr. Schaeffer, the librarian, reported the receipt of the following publications:

Deutsche Entomolog. Zeitschr., 1907, No. 5.

Mitth. aus d. Zool. Mus. in Berlin, Vol. III, No. 3.

Proc. Davenport Acad. Sci., Vol. X, Vol. XII, June and July.

Wiener Entomolog. Zeitung, Vol. XXVI, No. 10.

On Some Earwigs by A. N. Caudell.

Descr. of New N. Amer. Tineid Moths by Lord Walsingham.

No. Carolina Dept. Agric. Ent. Circul., Nos. 18 and 19.

No. Carolina Crop Pest Commission. Circ. No. 10, New Series.

Canadian Ent., Vol. XXXIX, No. 11.

Tijdschr. voor Entomologie, 1907.

As chairman of the committee to arrange for the binding of the unbound numbers of the Journal, Mr. Schaeffer reported that he had obtained an estimate of $1.50 per volume for a binding similar to that of the volumes already bound. On motion by Mr. Joutel, seconded by Dr. Wheeler, the report was accepted and the committee instructed to have the binding done.

The name of Mr. James H. Stebbins, Jr., was proposed for membership.

Under miscellaneous business Mr. Schaeffer reported that the specimens of Lepidoptera presented to the society by Mrs. Slosson, and to be sold for its benefit, had been mounted and identified by Mr. Doll.

The first paper of the evening was by Mr. Joutel on "Some Curious Results of the Crossing of *Cynthia* and *Promethea* Moths and Some Interesting Variations of *Cynthia*." He said he had obtained a number of hybrid moths as a result of crossing *Cynthia* and *Promethea* and exhibited a series of these. Of the crosses between the male *Cynthia* and female *Promethea* only one moth was obtained, while from the reciprocal cross a large series of moths was secured. The caterpillar of the latter cross was very similar to that of *Cynthia* but that of the other was quite distinct in appearance. The hybrid moths resembled *Cynthia* very much but when carefully compared showed decided differences. They were uniformly smaller than *Cynthia* and there was a narrowing of the transverse lines which tended to approach each other at their middle points. These same variations, however, were occasionally found among true *Cynthia*. Of the two crosses, that obtained by mating male *Promethea* with female *Cynthia* was the stronger, and further experiments were being carried on by crossing these among themselves.

Mr. Schaeffer next spoke on "A Few New and Interesting Cerambycidæ." He had recently gone over his collection of Cerambycidæ and noted several new and interesting forms, some of which he exhibited and briefly discussed.

Mr. Schaeffer also exhibited a box of insects which he had collected in Arizona illustrating mimicry and protective coloration and spoke concerning them briefly as follows: The grasshopper — *Tomatus ferruginosus* — a species with red hind wings was observed moving rapidly along the road and was difficult to capture, but when resting on the oak leaves where its color protected it, it made little effort to get away. He had found that the walking-stick *Tarabacillus coloradus* dropped to the ground readily and on account of its color was difficult to find. In like manner *Stagmomantis limbata* was also found to be well protected when resting on the grass. In beating, a few specimens of the Cerambycid, *Elytroleptus ignitus*, were noted among hundreds of the Lampyrid, *Lycostomus loripes*, which it very closely resembles. Another species of Cerambycidæ, *Necydalis cavipennis*, was mistaken at first for a common species of *Polistes* which it closely resembles both in action and general appearance. A fly, *Dasyllis fernaldi*, closely resembling *Bombus ternarius*, was also noticed, and the moth, *Tiprocris constans*, taken in some numbers, could easily be mistaken for the beetle *Lyctus ferandezi*, which it closely approaches in color, markings and flight. Besides these he had observed many other instances while in Arizona.

Dr. Wheeler spoke of a species *Mantispa* resembling *Polistes*, and Mr. Joutel mentioned *Euderces picipes* as a Coleopteron resembling an ant. Mr. Davis described

the manner in which the grasshopper, *Spharagemon saxatile*, rests on rocks where it is well protected by its color, and mentioned the many Sesiidæ resembling Hymenoptera and especially the species *Ægeria apiformis*, which is so named on account of its mimetic resemblance. Mr. Davis also exhibited several species of *Conocephalus* showing that both the brown and green forms of the various species could be found.

Dr. Zabriskie spoke "On the Swarming of the Weevil *Sphenophorus*." He said that recently his son, who was employed in the Diehl Co., which is part of the Singer Mfg. Co., situated at Elizabethport, N. J., called his attention to the fact that a weevil was swarming at that place in immense numbers. On securing some of the insects he found that they were *Sphenophorus pertinax*. They came from a northerly direction and in such immense numbers that they became a nuisance. Many of them struck against the walls of the buildings and fell to the ground. Evidently they were aided in their flight by the gentle wind which was blowing at the time. The swarm lasted three days before it began to disappear. A box containing several species of this genus was exhibited by Dr. Zabriskie, who inquired whether any of the members had noted a similar swarming. It was mentioned that the beetles probably came from the marshes directly north of Elizabethport where they breed in the cattails, and Dr. Wheeler stated that he had seen numbers of them washed up on the shores of Lake Michigan. Mr. Leng stated that at one time he had observed a swarm of *Melanactes piceus* on Staten Island. Dr. Zabriskie said that he had noticed a variation in the color of the insects and that upon examination he found the coloring to be due to numerous fine hairs. Dr. Wheeler stated that in *Lixus* the coloration had been found by Leidig to be due to secretions which were replaced when rubbed off.

Dr. Wheeler said that on November 3 while at Garrison-on-Hudson he had found a number of nests of *Polistes metricus* attached to a boat-house and that hanging on some of these were a few females, larvæ in cells, and honey in some of the empty cells. Thus a tendency was indicated by these insects to store food and hibernate. He stated further that Marshal and other European writers had noted this tendency in some species, among others *Polistes gallica*. A *Polistes* in California had been observed storing honey in quantity in its combs and this was also done by many species of South American wasps. A nest in the museum of a species of *Polybia* from Mexico Dr. Wheeler had found interesting in this respect. There was a zone of brood in the center of the combs of the nest, then a circle of empty cells and finally an outer zone of honey-filled cells. Accounts tell of early travelers in South America finding these nests, eating the honey and becoming sick as a result. In temperate regions this instinct is rarely noted and is probably a vestige of a *Polistes* habit well-developed in a former age when the insect lived in warmer regions. Mr. Southwick stated that he had examined many nests of *Polistes* but had never been able to find any honey in them.

In the early part of the year, on Staten Island, Mr. Davis observed on the same day in tin cans a number of *Polistes* nests and had found from one female and three cells to three females and several cells present. In Texas, it was noted, that many *Polistes* hibernate together.

Society adjourned.

MEETING OF DECEMBER 3, 1907.

Held at the American Museum of Natural History. President C. W. Leng in the chair, with fifteen members and four visitors present.

The proceedings of October 15 and November 19 were read and approved.

On motion of Mr. Southwick, Mr. J. H. Stebbins, 3 West 29th St., was elected an active member of the society.

Mr. Frank Watson, through Mr. Davis, proposed as an active member Mr. John H. Cook, 12 McPherson Terrace, Albany, New York.

Professor Raymond C. Osburn, of Barnard College, spoke concerning "The Syrphidæ of British Columbia." Among other things he described the striking structural characters of the family which are found in the venation of the wings, shape of head and abdomen and character of the antennæ. He spoke also of the mimetic forms of which there are a large number. The Syrphidæ are world wide in their distribution. About 2,500 species are so far known, but the tangled synonymy leaves the exact number in doubt. Verral lists 800 species from Europe and Aldrich in his list gives 680 species for all of North America. In 1886 Williston gave 300 species for the United States and Canada but many have been added since. It is likely that nearly 1,000 species may be accredited to the whole of North America.

In the summer of 1901 and 1902 Professor Osburn collected in British Columbia mainly about the southwest portion of Vancouver Island and incidently at Glacier, in the Selkirk Mts. In 1904, with the assistance of Mr. Harvey, he published a list of the Syrphidæ obtained by the latter, since which time he has received a considerable amount of new material from Mr. Harvey and others, and Dr. Dyar and Mr. Caudell in 1905 brought back some 41 species as a result of their collecting in British Columbia. Of these six or seven are new species. Of the 50 Syrphidæ more or less sent in by Mr. Harvey since the publication of the first list, six are new. Professor Osburn has examined all of the Syrphidæ in the National Museum and has altogether a list of 130 species from British Columbia. He spoke of the richness of the territory entomologically considered, of the great abundance of flowers upon the pollen of which the majority of the Syrphidæ love to feast, of the delights of collecting all through British Columbia. In regard to the distribution he said that nearly a fourth of the 130 species known from British Columbia are circumpolar. The remainder are about equally divided between those known only from the west and those which are also recorded from eastern North America and spreading clear across Canada and British Columbia. He found quite a number of forms that had spread north from California. He exhibited the new species of Syrphidæ from British Columbia, descriptions of which will soon appear in the Canadian Entomologist. Among the other important species shown were *Syrphus quinquelimbatus* Bigot, *Helophilus poreus* Walker and *Brachypalpus parvus* Willist., none of which has been recorded since they were described. *S. quinquelimbatus* was described in 1884 from southern California, *H. poreus* in 1849 from the Hudson Bay Territory and *B. parvus* in 1886 from Colorado. Forms which have recently acquired considerable economic importance are *Cheilosia alaskensis* Hunter and *Cheilosia hoodiana* Bigot, the larvæ of which have recently been shown by Burke to be the cause of the timber disease of the northwest affecting conifers and especially the western hemlock.

Professor John B. Smith took issue with Professor Osburn on the geographical range of insects from British Columbia, since he had found in the study of the Noctuidæ that there were almost no circumpolar forms and that the Noctuidæ from Vancouver region showed no southern California forms among them, but this faunal

region seemed to be distinctive, mixed with some few eastern forms which had spread westward throughout Canada.

Professor Wheeler remarked that he had found in the study of the ants a sort of intermediate condition and agreed with Mr. Charles Adams that there seemed to be two centers of distribution in British Columbia, an eastern and a western one, and that material gathered from north of Lake Superior showed a mixture of the two conditions.

Mr. Joutel said that *Saperda calcarata* and *tridentata* spread clear across the country in the north, and the western forms were like the eastern.

Mr. Joutel, in speaking of "The Persistence of Acquired Characters in Different Stages of Insects," stated that he had been inbreeding for a number of years a species of Japanese Bombycine moth and no deterioration in size or health was noticeable in recently bred adults or larvæ. Occasionally he had noticed a denuded specimen hatching from an apparently normal cocoon, and in one species he had found five newly hatched denuded adults, but was not successful in mating two denuded forms. He did succeed in mating and securing eggs from one denuded and one undenuded adult moth. The eggs obtained from this mating of the denuded form were different from the normal egg in not having a coating on them, which makes it appear probable that this peculiarity was due to some condition of the adult.

Mr. Matausch exhibited numerous, excellent and well-colored original drawings of exotic Membracidæ. Most of the species represented were from South America.

Mr. Davis exhibited sections of a white pine tree, each about a foot in diameter, showing the tunnels and chambers made by the carpenter ant, *Camponotus herculeanus pennsylvanicus* De Geer. The tree had stood over 60 feet high and was one of a grove on Staten Island, but the ants had removed so much of the solid wood that it had snapped off about 6 ft. from the ground during a gale of wind. The nest occupied about 4 in. of the diameter of the tree, and for the first four feet most of the wood had been removed. Above this, for 15 in., there were galleries and chambers, and above this again there was a finger-like tunnel ½ in. in diameter and 8 in. long, that occupied the center of the trunk. Mr. Davis also showed a section of a scarlet oak that had been occupied by the same species of ant, and the nest was divided off in the same way as in the pine, with this difference that the character of the oak wood did not permit of the excavation, in the lower part of the nest, of the many paper-like layers represented in the corresponding portion of the nest in the pine. No matter in what kind of a tree, there seems to be constructed by this ant the same general kind of architecture.

Professor Wheeler exhibited a beetle (*Xenodusa cava*) a number of which Mr. Pricer of Urbana, Illinois, found in the burrows of *Camponotus pennsylvanicus*. This beetle is not common in collections.

Dr. E. P. Felt stated that considerable time had recently been spent by his office on investigations of gall midgets (Cecidomyidæ), but he had found it rather slow work and had been much handicapped owing to the tangled synonomy of the group. To show how much work they had been able to accomplish towards collecting and breeding these forms he gave a table showing side by side with the number of species given by Aldrich in his list, the number they had been able to add. Whereas, of those groups already investigated, a total number of 24 species is given by Aldrich, Dr. Felt has secured something like 217, and of these, too, a large

number of the galls have been studied and determined. Dr. Felt presented some of the difficulties which he had met in solving the problem of nomenclature in this group and asked for suggestions in solving the problem. They had reached a point in their work where to advance meant an answer to the question, what constitutes a description of a species. Mr. Southwick suggested that where the name of a certain insect had originally been given to the gall, and later to the insect itself, the former should be dropped. Professor Smith had little patience with this advice and stated that wherever the work of the insect had first received the name, and it could be determined as such, its name should be attached to the insect. He resented any implication that the descriptions of the older entomological workers were not satisfactory for their needs, and suggested that twenty years hence our descriptions of species would be found insufficient for the new conditions which might arise. Every worker who took up a group encountered the same trouble.

Professor Wheeler said that after all, the work of the insect was the most important consideration, and if the identity of the adult insects could not be determined, numbers might be employed to indicate them, as it made little difference what particular symbols were employed or whether the insect itself or the gall received the name. The important thing was to connect the proper insect with the proper gall.

Society adjourned.

MEETING OF DECEMBER 17, 1907.

Held at the American Museum of Natural History. President C. W. Leng in the chair, with eleven members present and three visitors.

The proceedings of December 3 were read and approved.

The librarian, Mr. Schaeffer, reported the receipt of the following papers :

"Origin of Slavery among Ants," by Professor Wm. M. Wheeler.

"On Certain Modified Hairs Peculiar to the Ants of Arid Regions," by Professor Wm. M. Wheeler.

Mr. J. H. Cook, of Albany, was elected an active member on motion of the secretary.

Mr. Beutenmüller proposed Mr. Andrew J. Mutchler, and Mr. Barber proposed Mr. Raymond C. Osburn as active members of the society. Elected by amending by-laws.

The secretary read a letter from the curator of entomology of the American Museum of Natural History, Mr. W. Beutenmüller, in which he invited the members to examine the entomological cabinets, which would be in charge of Mr. Mutchler on the meeting nights of the society.

Mr. Davis requested that the secretary express the thanks of the society to Mr. Beutenmüller.

The secretary read a letter from the secretary of the New York Academy of Sciences, Dr. E. O. Hovey, requesting the society to coöperate in arranging a course of lectures during the winter. On motion the letter was referred to the executive committee.

The president named the following committee to nominate officers for the coming year : Messrs. Joutel, Harris and Engelhardt.

Mr. Engelhardt discussed some of the work in silk culture, which had been attempted at the Children's Museum in Brooklyn. This work had been suggested by Mr. Joutel who had furnished some of the raw and finished silk to illustrate the

process. Some 3,000 silk worms were reared, and of these 300 were inflated and the rest allowed to pupate. Some of the pupæ were treated and the silk taken from the cocoons, a reel being made for the purpose. Photographs of the machinery and process were used to illustrate the exhibit in the museum. Mr. Engelhardt exhibited some silk gut which he had obtained from *Cecropia* and explained the process by which it was prepared, but his experience had shown this gut to be rotten. Nevertheless, it might be possible to perfect the process and thus obtain valuable gut. He spoke of the process as carried on chiefly in Spain and Italy with the true silk worm.

Mr. Engelhardt also exhibited some abnormal specimens of insects: a *Cecropia* with an extra fore wing and a katydid with two tarsi on the same leg. He spoke of the frequency of malformation in vertebrates, particularly among fish, and accounted for this through some accident or unusual condition to which the egg had been subjected. In this connection Mr. Davis exhibited an ox-beetle from Brazil which had three tarsi on one of the fore legs.

Mr. Joutel exhibited an *Elaphidion* with two antennæ springing from one basal joint, also a *Cremastochilus* which had the two front tibiæ on the left side unlike. To illustrate this subject further Mr. Osburn exhibited drawings of the head of *Syrphus arcuatus* which had only one compound eye and three antennæ. The extra antenna occupied the place where the normal eye should appear. The whole head was deformed. This malformation was probably due to injury during its early development. He spoke of a similar condition in the Crustacea determined by Herbst and also by Morgan. When a compound eye of these Arthropods is removed at the proper stage it will be replaced by an antenna.

Professor Wheeler spoke of a Dipteron (*Dilophus tibialis*) which he collected in Wyoming, and which had a beetle-like antenna growing out of one of its fore coxæ.

Mr. Joutel spoke of the importance of an attempt to cross and rear some of these monstrosities to determine whether the malformation would be inherited by the offspring; also of the frequency of abnormalities in trout caused by a disturbance of the eggs.

Mr. Schaeffer made some remarks on the factors which should determine faunal regions. He stated that his experience had shown that it was a mistake to place too much dependence upon insects of a particular region as factors in determining a faunal region, although certain groups, which were more fixed in their habits, might be taken as indicative. For instance, a number of collectors have maintained that Brownsville has a semi-tropical fauna. As a result of his investigations in that region, Mr. Schaeffer had found that in the Cerambycidæ taken there only 35 per cent. were semi-tropical; of the Lepidoptera only 20 per cent. were semi-tropical; the remainder belonging to the southern faunal regions of the United States. Investigation had shown that the flora of a particular region was the best determining factor.

Society adjourned.